HOW NOT TO SAVE THE PLANET[1]

Thom Brooks
Durham University

Abstract. Climate change presents us with perhaps the most pressing challenge today. But is it a problem we can solve? This article argues that existing conservationist and adaptation approaches fail to satisfy their objectives. A second issue that these approaches disagree about how best to end climate change, but accept that it is a problem that can be solved. I believe this view is mistaken: a future environmental catastrophe is an event we might at best postpone, but not avoid. This raises new ethical questions for climate change: what are the moral implications of a future climatic catastrophe that might be delayed at best? What practical consequences might these implications yield? This article argues most political philosophers have misunderstood the kind of problem that climate change presents and the daunting challenges we face.

I. Introduction

Climate change presents us with perhaps the most pressing challenge today. But is it a problem we can solve? The 'orthodox' view accepted by most political philosophers argues

[1] This essay has been presented at the universities of Boston, Cardiff, Durham, Edinburgh, Essex, Groningen, Oxford, Oxford Brookes, and Stirling, the Oxford Political Thought Conference and Political Studies Association annual meeting. I am most grateful to these audiences and others for helpful comments on earlier drafts, especially Robin Attfield, Andrea Baumeister, Richard Bellamy, Gillian Brock, Claire Brooks, Gary Browning, Alan Carter, Hugh Compston, James Connolly, Rowan Cruft, Boudewijn de Bruin, Liz Fraser, Fabian Freyenhagen, Mathias Frisch, Bruce Haddock, Iain Hampsher-Monk, Nicole Hassoun, Clare Heyward, Peter Hulm, Pauline Kleingeld, Joshua Knobe, Melissa Lane, Jonathan Lowe, Sandra Marshall, Wayne Martin, Liz McKinnell, David Miller, Margaret Moore, Aletta Norval, Jörgen Ödalen, David Owen, Soran Reader, Peri Roberts, David Schlosberg, Thomas Schramme, Esther Shubert, Matthew Noah Smith, Suzanne Sreedhar, Daniel Star, Martin van Hees, Margaretha Wewerinke, Jo Wolff, Hiro Yamazaki, and Lea Ypi. I am especially grateful for comments by anonymous referees.

that ending climate change is possible although there is deep disagreement about how it is so. I believe this orthodox view is mistaken: a future ice age or other environmental catastrophe is an event we might at best postpone, but not avoid. This raises new ethical questions for climate change: what are the moral implications of a future climatic catastrophe that might be delayed at best? What practical consequences might these implications yield? These concerns are too often neglected in favour of defending solutions that fail to solve the serious effects of climate change.

The effects of climate change and its causes are not controversial: there is a global consensus that accepts human activity is responsible for climate change and its associated dangers.[2] The Intergovernmental Panel on Climate Change (IPCC) has made clear that 'warming of the climate system is unequivocal': global average sea levels continue to rise while mountain glaciers and ice caps regularly decline coupled with an increasing frequency of extreme weather events.[3] Further dangers include the increasing threats to coastal wetlands due to rising sea levels, the greater likelihood of droughts affecting agricultural production, the spread of tropical diseases to new geographical regions and the more recent phenomena of 'environmental refugees'.[4] The climate is changing because of human activities, especially

[2] See Peter T. Doran and Maggie Kendall Zimmerman, 'Examining the Scientific Consensus on Climate Change', *EOS* 90 (2009): 286—300. For an exception, see Christopher Booker, *The Real Global Warming Disaster* (London: Continuum 2009).

[3] IPCC, *Climate Change 2013: The Physical Science Basis* (Cambridge: Cambridge University Press, 2013): 4 (available on the IPCC website: http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf) and IPCC, '2014: Summary for Policymakers' in *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press): 4—8 (available on the IPCC website: http://ipcc-wg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf.).

[4] Pachauri and Reisigner, *Climate Change 2007*, 33. On environmental refugees, see Sujatha Byravan and Sudhir Chella Rajan, 'The Ethical Implications of Sea-Level Rise Due to Climate Change', *Ethics and International Affairs* 24 (2010): 239—60; Avery Kolers, 'Floating Provisos and Sinking Islands', *Journal of Applied Philosophy* 29 (2012): 333—43; Cara Nine, 'Ecological Refugees, States Borders, and the Lockean Proviso', *Journal of Applied Philosophy* 27 (2010): 359—75; and Mathias Risse, 'The Right to Relocation:

in the creation of greenhouse gasses such as carbon emissions: it has been at least 420,000 years that the Earth has had so much carbon dioxide and methane in its atmosphere.[5] Many believe the dangers related to climate change pose the greatest problems for governments today.[6]

Our challenge is not to consider whether there is climate change, but how best to respond to it.[7] While a global consensus accepts the existence of climate change, there is significant disagreement about how best to address this challenge. Mainstream proposals generally support one of two competing and overlapping approaches. Both aim to effectively overcome the problems associated with climate change to ensure its associated dangers do not lead to the planet becoming inhospitable for human beings.[8] One approach is largely conservationist. Its goal is to reduce carbon emissions in order to end further contributing to climate change and, thus, better manage associated dangers by decreasing continued climate

---

Disappearing Island Nations and Common Ownership of the Earth', *Ethics and International Affairs* 23 (2009): 281—300.

[5] See Singer, *One World*, 16. There are many different greenhouse gasses beyond carbon emissions, including aerosols and methane. While methane is more potent, it remains in the atmosphere for only about 12 years whereas carbon emissions are created in far larger quantities by human activity and they may remain up to 200 years in the atmosphere. See Stephen Gardiner, 'Ethics and Global Climate Change', *Ethics* 114 (2004): 555—600, at 561.

[6] For example, see Albert Gore, *Earth in the Balance: Ecology and the Human Spirit* (Boston: Houghton Mifflin, 1992); David A. King, 'Climate Change Science: Adapt, Mitigate, or Ignore?' *Science* 9 (2004): 176—77; and Martin L. Parry, Nigel W. Arnell, Anthony J. McMichael, Robert J. Nicholls, Pim Martens, R. Sari Kovats, Matthew T. J. Livermoore, Cynthia Rosenzweig, Ana Iglesias, and Gunther Fischer, 'Millions at Risk: Defining Critical Climate Change Threats and Targets', *Global Environmental Change–Human and Policy Dimensions* (2001): 181—83.

[7] There are some noteworthy criticisms of IPCC findings. See Ronald Bailey (ed.), *The True State of the Planet: Ten of the World's Premier Environmental Researchers in a Major Challenge to the Environmental Movement* (New York: Free Press, 1995); Bjorn Lomborg, *The Skeptical Environmentalist: Measuring the Real State of the World* (Cambridge: Cambridge University Press, 1998); and Bjorn Lomborg, *Cool It: The Skeptical Environmentalist's Guide to Global Warming* (New York: Vintage, 2008).

[8] For alternative views, see Mike Hulme, *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity* (Cambridge: Cambridge University Press, 2009) and James Lovelock, *The Ages of Gaia: A Biography of Our Living Earth, 2d ed*

changes.[9] A second approach is focused more specifically on adaptation strategies where the goal is to better adapt ourselves to the environment so we become more effectively protected from the associated dangers of climate change. While most proposals incorporate elements of *both* conservation and adaptation, there remains a clear division between these approaches in terms of the greater priority different proposals have for one approach over the other permitting this classification into broadly two approaches.[10]

I critically examine several existing proposals to overcome the problem of climate change and argue they are unsatisfactory for new reasons, including that they fail to offer satisfactory proposals for future sustainability and lead to additional problems. The following three sections consider each approach in turn. I argue these proposals are objectionable because they misunderstand the kind of challenge that climate change presents. A clearer understanding of this challenge highlights the need to conceive of climate change as a problem to be managed and perhaps never solved. The final section of the paper considers the possible implications for our theories about climate change justice.

II. Conservation: The Ecological Footprint

The most common approach to climate change ethics is *conservation*. Conservationists argue that the best way to address climate change and its associated dangers is to remove further

---

(Oxford: Oxford University Press, 2000).

[9] Carbon emissions are a major part of human activity that contributes to climate change, but it is not the only part. I will discuss climate change in relation to carbon emissions to help simplify the discussion. My focus is not on whether there is climate change and how it is cause, but rather on the question of how best to address climate change if we accept the global consensus on its existence and cause. The conservationist approaches considered in sections II and III are also understood in terms of mitigation. See Darrel Moellendorf, 'Treaty Norms and Climate Change Mitigation', *Ethics and International Affairs* 23 (2009): 247—65.

[10] See Anthony Giddens, *The Politics of Climate Change* (Cambridge: Polity, 2009): 13.

change in order to end contributions to further dangers.[11] Conservation proposals differ on how best to bring about a reduction in carbon emissions.

Conservationism is a wide tent encompassing a diversity of policy proposals. I will examine the two leading proposals, the ecological footprint and the polluter pays principle. I do not claim that all conservationists endorse or should endorse both proposals. My aim is to argue that each proposal aims at conservationism and highlight problems each faces at achieving its aim.

The idea of an 'ecological footprint' is one approach to addressing climate change.[12] Our footprint is a measure of human carrying capacity: the maximum rate of resource consumption that can be sustained indefinitely.[13] Every person leaves an ecological footprint. The problem is that too often our footprint is much larger than the environment might sustain. We should ensure that our environmental impact does not collectively threaten carrying capacity. The ecological footprint strategy is a conservationist approach because it entails real reductions in human consumption, including carbon emissions. The ecological footprint

[11] This approach is often understood as 'mitigation' because it aims to provide policies enabling the mitigation of environmental impact by humans. Mitigation may take several forms and my focus is on strategies that aim to mitigate environmental impact through conservationist measures. My use of 'conservation' is meant to single-out this focus on distinctive approaches to mitigation.

[12] See Jeroen C. J. M. Van den Bergh and Harmen Verbruggen, 'Spatial Sustainability, Trade, Trade, and Indicators: An Evalutaion of the "Ecological Footprint"', *Ecological Economics* 29 (1999): 63—74; Steve Vanderheiden, 'Two Conceptions of Sustainability', *Political Studies* 56 (2008): 435—55; Mathis Wackernagel and William E. Rees, *Our Ecological Footprint: Reducing Human Impact on the Earth* (Gabriola Island: New Society Publishers, 1996); Mathis Wackernagel and William E. Rees, 'Perceptual and Structural Barriers to Investing in Natural Capital: Economics from an Ecological Footprint Perspective', *Ecological Economics* 20 (1997): 3—24. The World Wildlife Fund has an online footprint calculator here: http://footprint.wwf.org.uk/.)

[13] See William E. Rees, 'Ecological Footprints and Appropriated Carrying Capacity: What Urban Economics Leaves Out', *Environment and Urbanization* 4 (1992): 121—30, esp. 125. See also Dale Jamieson, *Ethics and the Environment* (Cambridge: Cambridge University Press, 2008): 184 and Arjen Y. Hoekstra and Mesfin M. Mekonnen, "The Water Footprint of Humanity," *Proceedings of the National Academy of Science* 109: 3232—37.

approach is also egalitarian. Each person must live within an equal ecological footprint. The footprint is no bigger than can guarantee human sustainability if each person had an equal size. Therefore, we are not permitted to consume and pollute more than others. We share global conservation equally.[14]

A second method of determining our ecological footprint considers equal shares to the absorption capacity of our atmosphere's sink.[15] The atmosphere's sink belongs to all in common. If some were to use more than their fair share, then others would be deprived of their fair shares. We have a duty to each other against using more than our fair shares and we may owe others compensation where we neglect this duty.[16] The idea is that we can guarantee sustainability by ensuring all emissions are absorbed within the atmosphere's sink. We each have an equal share in the use of the global sink and this will require major emission reductions.[17]

There is much evidence to suggest that the populations in some countries are living beyond the limits of their ecological footprints. For example, measuring world carbon emissions between 1950 to 1986 revealed that 'the United States, with about 5 percent of the world's population at that time, was responsible for 30 percent of the cumulative emissions, whereas India, with 17 percent of the world's population, was responsible for less than 2 percent of the emissions'.[18] The idea of an ecological footprint appears to be a helpful device

[14] This idea is related to the idea of ecological debt. We may owe others an ecological debt whenever we live beyond our ecological footprint. See Simms, *Ecological Debt*, 88.

[15] See Singer, *One World*, 28 and Martino Traxler, 'Fair Chore Division for Climate Change', *Social Theory and Practice* 28 (2002): 101—34.

[16] I will discuss the problems of compensation and environmental goods in the following section.

[17] There is a difference between ecological footprints and equal shares in the global atmospheric sink. Ecological footprints are a wider measure of impact on global ecology, while equal shares of the atmospheric sink is focused particularly on atmospheric gases, especially carbon emissions.

[18] Singer, *One World*, 32.

in addressing issues pertaining to climate change. Some argue that climate change is an example of 'the tragedy of the commons'.[19] When different people have access to an unregulated good, their individual actions may lead to decidedly less than optimal overall outcomes. The idea of an ecological footprint is believed to help correct this tragedy.

An important motivation for why we should adopt conservationist measures, such as the ecological footprint, is because failing to so would make us responsible for harming others.[20] The idea of harm is a complex subject that lacks any simple definition and I will only offer general remarks. Conservationists often focus on our collective responsibility for contributing to environmental damage and not mere environmental change. Plant and animal species may adapt and evolve because of environmental change and this need not confirm environmental damage: environmental change is not always environmental damage.[21] Instead, environmental damage entails ecological changes that may be detrimental to plant and animal species. Such changes endanger their continued flourishing, including the risk of extinction. Conservationists understand harm to the environment as a detrimental change to plant and animal species that endanger their continued flourishing for which human beings are responsible.[22] This harm is further understood to have potential detrimental effects upon

[19] See Garrett Hardin, 'The Tragedy of the Commons', *Science* 162 (1968): 1243—48 and Christopher Knapp, 'Tragedies without Commons', *Public Affairs Quarterly* 25 (2011): 81—94.

[20] This is one important motivation for many conservationists, but not the only motivation. See Peter Singer, 'One Atmosphere' in *One World: The Ethics of Globalization, 2nd ed* (New Haven: Yale University Press, 2004): 14—50.

[21] It is not the presence of carbon emissions or other greenhouse gases that is the problem. Indeed, there is already 'a purely natural greenhouse effect' responsible for a warmer surface temperature. John Houghton argues that the Earth's surface temperature is 15ºC instead of -6ºC. See Gardiner, 'Ethics and Global Climate Change', 557—58 and John Houghton, *Global Warming: The Complete Briefing, 2d ed* (Cambridge: Cambridge University Press, 1997): 11—12.

[22] I do not suggest that this is the only nor the primary understanding of harm held by conservationists. Other understandings might include any damage to our aesthetic experience of nature. See Jamieson, *Ethics and the Environment*, 158—62.

future generations, a complex topic with its own literature that I will bracket for this discussion.[23]

The ecological footprint approach to conservation has several limitations. The first is that it is an anthropocentric approach.[24] The ecological footprint is a determination of the carrying capacity of human beings. We measure the impact of our activities upon the environment; we do not have regard to the environmental impact of plant and animal species. This anthropocentric perspective may be helpful in planning a sustainable future for humanity. The problem remains that the sustainable carrying capacity of human activities may not be coextensive with the sustainable carrying capacity for non-humans. The ecological footprint may lead to a future of sustainable human activities, but this may not include continued flourishing of the natural world. If human sustainability can be guaranteed at the cost of nature's diminished flourishing, then the ecological footprint is an approach that might better ensure the conservation of human beings at the cost of conserving nature.[25]

A second limitation concerns equality and fairness. The ecological footprint is thought

[23] One compelling approach to thinking about harm, future generations, and the non-identity problem is offered by Joseph Mazor. He argues that present persons have justice-based obligations to each other to conserve natural resources for future generations where these generations as understood as 'a chain of overlapping generations' rather than monoliths. See Joseph Mazor, 'Liberal Justice, Future People, and Natural Resource Conservation', *Philosophy and Public Affairs* 38 (2010): 380—408 and Edward A. Page, *Climate Change, Justice, and Future Generations* (Cheltenham: Edward Elgar, 2006). On the non-identity problem more generally, see Derek Parfit, *Reasons and Persons* (Oxford: Oxford University Press, 1984): 351—80.

[24] On anthropocentrism and climate change ethics more generally, see Nicole Hassoun, 'The Anthropocentric Advantage? Environmental Ethics and Climate Change Policy', *Critical Review of International Social and Political Philosophy* 14 (2011): 235—57.

[25] This position does not deny that we are 'trustees of the planet'. (See Robin Attfield, *The Ethics of the Global Environment* (Edinburgh: Edinburgh University Press, 1999): 45.) Moreover, we may prefer to favour ourselves over the natural world. My claim is not that this is a view we should reject, but rather that the ecological footprint treats the natural environment as secondary, or perhaps as instrumental, to human sustainability. My thanks to Matthew Noah Smith for raising this issue.

to treat all persons on an equal and fair footing.[26] We are each to live within the bounds of our ecological footprint to ensure a sustainable future and this footprint is uniformly equal for all. One worry is that footprints of equal sizes may not be fair. This is because my fair use of the environment in terms of my satisfactory nourishment and bodily needs may differ from others. Childbirth and old age may require a greater need for a larger footprint. Additionally, persons with different heights and body mass may have differences in resource needs. There are also potential gender differences in resource needs pertaining to pregnancy. So there is no 'one size fits all' ecological footprint we may apply to everyone nor is there any single, fixed footprint for any individual as our footprint may change over our life as we change. If we were able to account for individual differences between persons over a life, then the fair solution may not be to agree an equal size ecological footprint. This is because there is the further problem of resource needs in relation to natural climate. Persons living in some climates will have different resource needs than others. Determining fair ecological footprints may often entail unequal sizes to accommodate these differences.

Ecological footprints may also be unfair. Societies have developed differently in relation to their wealth and technological advances. Suppose that we agreed a uniform average of the ecological footprint and that each society had a footprint equal to this average multiplied by the relevant population. This equal distribution could lead to greater unfairness in ossifying the relative positions of the wealthy and technological advanced versus the more poor and less technologically developed. More wealthy and technologically advanced

[26] See Anil Agarwal and Sunita Narain, *Global Warming in an Unequal World: A Case of Environmental Colonialism* (New Delhi: Centre for Science and Environment, 1991); Paul Baer, 'Equity, Greenhouse Gas Emissions, and Global Common Resources', in Stephen H. Schneider, Armin Rosencranz, and John O. Niles (eds), *Climate Change Policy: A Survey* (Washington, DC: Island Press, 2002): 393—408; and Dale Jamieson, 'The Epistemology of Climate Change: Some Morals for Managers', *Society and Natural Resources* 4 (1991): 319—29.

societies would be in a much better position to make the most from their limited footprint.[27] This would permit them to better retain their position of global privilege over less capable societies.[28] The ecological footprint would not treat persons equally or fairly.

There is also the problem of overpopulation. The ecological footprint is an indication of sustainable ecological space. Overpopulation would make it impossible for all to live within an ecological footprint of equal size. This is because their footprints would point beyond sustainability when taken together. Ecological footprints require the absence of overpopulation and assume there is sufficient sustainable ecological space for all.[29]

A final conservationist proposal is carbon trading.[30] The idea is that each country

[27] See Tim Hayward, *Constitutional Environmental Rights* (Oxford: Oxford University Press, 2005): 198.

[28] See Vanderheiden, 'Two Conceptions of Sustainability', 446—47.

[29] The size of our ecological footprint would increase with a decrease in human population. This might offer unjust regimes a perverse reason to attack civilians elsewhere in order to expand the size of their footprints—and the footprints of all.

[30] See Simon Caney and Cameron Hepburn, 'Carbon Trading: Unethical, Unjust and Ineffective?' *Philosophy* 69 (2011): 201—34; Cameron Hepburn, 'Carbon Trading: A Review of the Kyoto Mechanisms', *Annual Review of Environmental Resources* 32 (2007): 375—93; Cameron Hepburn and Nicholas Stern, 'The Global Deal on Climate Change' in Dieter Helm and Cameron Hepburn (eds), *The Economics and Politics of Climate Change* (Oxford: Oxford University Press, 2009): 36—57, esp. 49—53 J. Kurtzman, 'The Low Carbon Diet', *Foreign Policy* 88 (2009): 114—22; M. Lazarowicz, *Global Carbon Trading: A Framework for Reducing Emissions* (London: TSO, 2009); Edward A. Page, 'Cosmopolitanism, Climate Change, and Greenhouse Gas Emissions Trading', *International Theory* 3 (2011): 37—69; Edward A. Page, 'Cashing in on Climate Change: Political Theory and Global Emissions Trading', *Critical Review of International Social and Political Philosophy* 14 (2011): 1—15; C. M. Rose, 'Expanding the Choices for the Global Commons: Comparing Newfangled Tradable Allowance Schemes to Old-Fashioned Common Property Regimes', *Duke Environmental Law and Policy Forum* 10 (2000): 45—72, at 52—68; Mark Sagoff, 'Controlling Global Climate: The Debate Over Pollution Trading', in V. V. Gehring and W. A. Galston (eds), *Philosophical Dimensions of Public Policy* (London: Transaction Publishers, 2002): 311—18; R. N. Stavins, 'Addressing Climate Change with a Comprehensive US Cap-and-Trade System', *Oxford Review of Economic Policy* 24 (2008): 298—321; and T. Tietenberg, *Emissions Trading: Principles and Practice, 2d ed* (Washington, DC: Resources for the Future, 2006): 25—47, 192—203. While carbon trading can be understood as part of a conservationist approach, I do not argue or recommend that all conservationists are or should be supporters of carbon trading. I noted at the beginning of this section that conservationism is a large tent encompassing a diverse variety of proposals:

possesses shares in carbon emissions. None can produce more carbon emissions than they have shares for. States may purchase emissions credits from others to permissibly produce additional carbon emissions. This has many potential benefits including making it easier for states with higher carbon emissions to bring these more gradually to lower levels.

The primary limitation is that carbon trading may produce a negative effect on our motivations to conserve.[31] Conservationists believe we should conserve to best address the associated dangers of climate change. Therefore, we should not contribute to climate change. Carbon trading does not ensure that each state becomes more sustainable. Instead, it is a mechanism to guarantee better that the global system taken as a whole may become more sustainable. Sufficiently wealthy citizens who can purchase carbon credits may continue to produce increasing emissions than citizens elsewhere. The wealthy few may enjoy greater resource use and material luxuries at the expense of a majority left with much less.[32] The problem is that the wealthy few are also the largest polluters. Carbon trading may not offer sufficiently attractive incentives to pollute less. Instead, it might lead to ossifying the global status quo.[33]

The ecological footprint is an unsatisfactory solution as currently defended to how we might best address the associated dangers of climate change.

---

carbon trading is part of this diversity.

[31] See Andrew Dobson, *Citizenship and the Environment* (Oxford: Oxford University Press, 2003): 2—3 and Eric Posner and Cass Sunstein, 'Should Greenhouse Gas Permits Be Allocated on a Per Capita Basis?' *California Law Review* 97 (2009): 51—93.

[32] See Henry Shue, 'Subsistence Emissions and Luxury Emissions', *Law and Policy* 15 (1993): 39—59.

[33] My view is similar to Posner and Sunstein's argument that carbon trading lacks sufficiently attractive incentives for major polluters, such as the United States, to pollute less. My concern goes further: my worry is that not only scepticism about the effectiveness of carbon trading for reducing carbon emissions to the levels required for sustainability, but that the system is likely to return unequal benefits in favour of the affluent and technologically

III. Conservation: The polluter pays principle

The *polluter pays principle* is an alternative conservationist approach to the ecological footprint.[34] The principle is built upon the premise that we have a negative duty to compensate others for the harm we have caused. Polluters should compensate others for their carbon emissions. Their compensation ought to minimize, if not annul, environmental damage relating to these emissions.

The polluter pays principle entails considerations of harm, compensation, and its conservationist potential. We have already noted the difficulty of identifying harm above. The idea of compensation is similarly complex. First, we may be tempted to understand the polluter pays principle as a compensation principle. The polluter ought to pay because she should compensate. The notion that polluters should compensate rather than merely pay better invokes the idea that they are addressing a wrong. This highlights the important difference between a fine and a fee.[35] A fine similarly invokes a wrong whereas a fee does not. This is one reason to understand what the polluter should pay as a fine. Moreover, the idea of a fine might better contribute to a sense of common responsibility relating to climate change.

---

advanced against the more poor and less technologically able.

[34] See Simon Caney, 'Cosmopolitan Justice, Responsibility, and Global Climate Change', *Leiden Journal of International Law* 18 (2005): 747—75; S. Gaines, 'The Polluter-Pays Principle : From Economic Equity to Environmental Ethos', *Texas International Law Journal* 26 (1991): 463—95; Giddens, *The Politics of Climate Change*, 92; Eric Neumayer, 'In Defence of Historical Accountability for Greenhouse Gas Emissions', *Ecological Economics* 33 (2000): 185—92; and Henry Shue, 'Global Environment and International Inequality', *International Affairs* 75 (1999): 533—37. My argument is that the conservationist approach is inclusive of a diversity of proposals on how conservationism might be achieved and this includes the polluter pays principle and ecological footprint amongst many others. I do not claim that all conservationists endorse one or the other, but instead that each is a conservationist proposal and that they are among the most popular conservationist proposals.

[35] See Michael Sandel, 'Should We Buy the Right to Pollute?' in *Public Philosophy: Essays on Morality in Politics* (Cambridge: Harvard University Press, 2005): 93—96.

Secondly, it is far from clear whether we can compensate environmental damage.[36] Should it be permissible to provide compensation for making a species extinct? And what if others reject an offer of compensation? The polluter pays principle assumes we can compensate for environmental damage.[37] The principle further assumes that compensation is unproblematic and it would be widely acceptable. These assumptions presume too much. Environmental goods, such as a specie's existence, may not be compensatory goods and we cannot assume all environmental impacts have a discernible monetary cost. Likewise, it remains unclear why we should in principle permit compensation from others to address our being subjected to their environmental damage.

There are further limitations with this approach. One is the problem of determining the identity of polluters. We are all the polluters and the victims of pollution. So who pays whom?[38] A common view is to claim that the relevant agents are states with collective responsibilities.[39] This raises issues of whether current generations should compensate for the policies of previous generations that have led to climate change, or what we might call 'environmental reparations'. This issue is thorny although some believe the problem less vexing. For example, James Garvey says: 'It is a straightforward fact that some countries have emitted more greenhouse gases–used up more of the planet's sinks, caused more climate change–than others. It's a quantifiable fact: we know something about cumulative

[36] My thanks to Melissa Lane for highlighting this important problem.

[37] It could be argued that the problem is the principle is too strong: instead of claiming we can and should compensate *in full* for any environmental damage, it should defend our compensating *as best as is possible*, or 'partial compensation' (and not 'full compensation'). But the general problem does not go away: if environmental goods are non-compensatory goods, then adopting a position of full or partial compensation is inadequate.

[38] See Paul Baer, 'Adaptation: Who Pays Whom', in Neil Adger, et al (eds), *Fairness in Adaptation to Climate Change* (Cambridge: MIT Press, 2006): 131—54.

[39] See Caney, 'Cosmopolitan Justice, Responsibility, and Global Climate Change', 755. On the problem with states and responsibility, see Onora O'Neill, 'Agents of Justice', *Metaphilosophy* 32 (2001): 180—95.

emissions'.[40] If this were true, then there would remain the issue of cut-off points: how far back should we go to assess past emissions? Our data on cumulative emissions does not go back very far. We must have some satisfactory rationale for potentially penalizing states on account of their carbon emissions over such an arbitrary time period.

A second limitation is determining how much a polluter should pay. We are witnessing the associated dangers of climate change today. This gives us reason to act. However, current climate change is a result of earlier practices by past generations. How much we should pay must address this historical dimension. Nicholas Stern argues that greenhouse gas emissions are an example of 'the greatest market failure the world has ever seen'.[41] This is because the prices of goods, such as petrol, do not reflect the true costs to society of their production and use. The polluter pays principle focuses on consumption, but not production which is a mistake: we should focus on both.[42] Polluters who create carbon emissions through their oil consumption share responsibility for the full cost of pollution with the oil refineries who produce oil for the market, for example. So if we argue that creating carbon emissions may entail having to pay for the pollution, then we should recognize that carbon emissions arise with production and consumption.[43] Both must be reflected in calculating how much we should pay.

A final limitation is that the polluter pays principle does not guarantee environmental conservation. One reason is that some proposals take the form of a tax on oil consumption.

---

[40] James Garvey, *The Ethics of Climate Change: Right and Wrong in a Warming World* (London: Continuum, 2008): 115.

[41] Stern, *A Blueprint for a Safer Planet*, 11.

[42] See Stern, *A Blueprint for a Safer Planet*, 159.

[43] Note that the polluter pays principle can apply to cases beyond oil consumption. The issue is not whether pollution is carbon-based *per se*, but rather whether the pollution contributes to some environmental harm such as climate change and its potentially harmful effects. Emissions of other products, such as methane, may also be relevant for a polluter pays principle to consider.

The idea is that higher oil costs will lead to a sustainable amount of carbon emissions. While higher costs are associated with less emissions, there is no evidence to suggest that they will drop sufficiently low.[44] A second reason is that the polluter can pollute as much as he can pay for. If polluters are assumed able to pay for the environmental costs from their emissions, then global carbon emissions may rise where polluters have the ability to pay.

Some polluter pays principle advocates are sensitive to these objections. For example, Simon Caney argues that we are all under a duty not to exceed our quota for greenhouse gas emissions.[45] Global emissions must be capped. Polluters should still pay when producing carbon emissions because we have a duty to compensate others through mitigation or adaptation. The resources raised through a polluter pays scheme could contribute to conservation. The problem is that the principle loses its motivational force. A negative duty to compensate for potential risk of environmental harm may be more compelling than a positive duty to compensate despite the absence of risk. If global emissions were capped to ensure conservation, then polluters would not need to compensate others for any harm because none would arise within the global emissions cap. The polluter pays principle is reduced to a positive duty with the aim of generating resources to assist conservation rather than a negative duty aim to compensate for harm. The problem is that the claim for polluters paying others is founded on the idea that polluters harm others by polluting. If emissions are capped so that no polluter harms others by polluting, then it becomes unclear why polluters have a duty to compensate others because they would not have a negative duty to do so.

The polluter pays principle is an unsatisfactory solution to how we might best address

[44] See U.S. Energy Information Administration, *International Energy Outlook 2011* (Washington, D.C.: U.S. Energy Information Administration, 2011): 6-7 (available online here: http://www.eia.gov/forecasts/ieo/emissions.cfm/.)

[45] See Caney, 'Cosmopolitan Justice, Responsibility, and Global Climate Change', 769.

the associated dangers of climate change.

IV. Adaptation

Adaptation is the leading alternative approach to conservation. It is important to note that adaptation is widely understood to be a reality, not an option.[46] Most conservationists accept that climate change policy must incorporate adaptation because any mitigation through conservation 'will not be enough'.[47] For example, Stephen Gardiner argues:

> The first thing to note . . . is that adaptation measures will clearly need to be part of any sensible climate policy, because we are already committed to some warming due to past emissions, and almost all of the proposed abatement strategies envisage that overall global emissions will continue to rise for at least the next few decades, committing us to even more.[48]

Adaptation may play an important role in formulating climate change policy along with some reduction in carbon emissions. The question is whether adaptation is an appropriate primary solution to the problem of climate change rather than conservation.

Adaptation advocates share several views in common. The first is less certainty that major reductions in carbon emissions are necessary: 'we will save ourselves by adapting to our ever-changing circumstances . . . At the end of the day, the story will have a happy

[46] See Giddens, *The Politics of Climate Change*, 161: 'Whatever happens from now on, climate change is going to affect our lives and we will have to adapt to its consequences'. See also Dale Jamieson, *Reason in a Dark Time: Why the Struggle Against Climate Change Failed—and What It Means for Our Future* (Oxford: Oxford University Press, 2014).

[47] See Michael D. Mastrandrea and Stephen H. Schneider, *Preparing for Climate Change* (Cambridge: MIT Press, 2010): 13.

[48] Gardiner, 'Ethics and Global Climate Change', 573.

ending'.[49] While there is no doubt that climate change is taking place, there is greater certainty that we can effectively adapt to the changing conditions we will face in future.[50] Major adaptation efforts, such as greater urbanization and reliance on genetically modified foods and nuclear energy, can provide a satisfactory solution.[51]

One reason why we should focus more on adaptation rather than conservation is because the former is a more cost-effective approach, or so adaptation advocate argue. For example, Bjorn Lomborg says: 'it will be far more expensive to cut CO2 emissions radically than to pay the costs of adaptation to the increased temperatures'.[52] Conservationist approaches are estimated to cost about 2% of GDP per annum (or roughly $1 trillion per annum).[53] Our resources are better spent adapting ourselves to climate change and spending our savings on other major social issues, such as poverty alleviation.[54] We should reduce emissions to a level of sustainable adaptability, this will cost less than reducing emissions levels to a sustainable level not requiring adaptation measures, and the savings may be used to do more good for the global poor than mere protection from the associated dangers of climate change.[55]

Adaptation measures may take several forms. The potential threats to coastal

---

[49] Matthew E. Kahn, *Climatopolis: How Our Cities Will Thrive in the Hotter Future* (New York: Basic Books, 2010): 7, 12.

[50] See Steven D. Levitt and Stephen J. Dubner, *Superfreakonomics* (London: Penguin, 2010): 169 (on 'worldwide catastrophe' from climate change: 'its likelihood is so uncertain').

[51] See Stewart Brand, *Whole Earth Discipline, revised ed* (London: Atlantic Books, 2010).

[52] Lomborg, *The Skeptical Environmentalist*, 318.

[53] See Stern, *A Blueprint for a Safer Planet*, 54.

[54] See Lomborg, *Cool It*, 8, 35.

[55] One related issue is whether economic theory can successfully address a cost-benefit analysis concerning climate change. See John Broome, *Counting the Cost of Global Warming* (Isle of Harris: White Horse Press, 1992): 19. This may be particularly true with regard to ascertaining the relevant costs to nonhumans and noneconomic costs to humans. See Mark Sagoff, *The Economy of the Earth* (Cambridge: Cambridge University Press, 1988) and David Schmidtz, 'A Place for Cost-Benefit Analysis', *Noûs* (supplement) 11 (2001):

communities from rising sea water may be addressed through building better flood defenses or relocation. Climate change will see land become more arid and less agriculturally productive. We may address this problem through the greater use of genetically modified crops that may better thrive than traditional crops. Tropical diseases spreading to new geographical areas might be approached through inoculation measures. These measures can provide us with a sustainable future without engaging in costly major emissions reductions.

These measures are understood anthropocentrically.[56] So we speak of relocating human communities or genetic modified food to feed human beings. There is little consideration of how the natural world might be better adapted to ensure continued flourishing. Adaptation is primarily about how we might best adapt to climate change. There is less concern about how plant and animal species may be affected by climate change than found with conservationist approaches in general.[57]

The adaptation approach has several limitations that relate to its overconfidence in our ability to successfully adapt. One limitation is future uncertainty about the environment.[58] What future must we adapt to? We must especially have a clearer conception about a future of adaptation rather than conservation. While there are models of likely effects from climate change in our near future, these models become far more speculative the further ahead we look. Adaptation is a strategy for a future world about which we lack sufficient clarity and

---

148-71.

[56] See Lomborg, *The Skeptical Environmentalist*, 11.

[57] It is a curiosity then that the leading approaches to climate change are anthropocentric. One possible reason is to address the problem of human motivation. Citizens and political leaders may be more likely to address climate change if our focus is on the potential threat to human sustainability. Besides, the spotted owl cannot vote. Nevertheless, it may be surprising that environmental ethics largely focuses upon how the environment might best sustain human beings rather than the more 'green' consideration of how human beings might better serve nature. This is an important issue I bracket here.

[58] See Raino Malnes, 'Climate Science and the Way We Ought to Think About Danger', *Environmental Politics* 17 (2008): 660—72.

certainty.

A second limitation is future uncertainty about the likely success of adaptation measures. Suppose we could have confidence in models of future environmental conditions should we choose adaptation over conservation. The problem is that we cannot safely test proposals in the way that many biologists or chemists may conduct experiments in a controlled laboratory. Any measures would have some real degree of uncertainty of success beyond an acceptable level given the very high costs of failure. Indeed, many proposed adaptation measures have either not been tried or do not yet exist.[59] For example, some argue in favour of 'carbon capture' where carbon is removed from the atmosphere and pumped into depleted oil fields deep underwater.[60] The problem is that the future risk to human and marine life is unknown with potentially deadly consequences for both.[61]

Many have put great faith in technology to help address climate change: 'In a world with billions of educated, ambitious individuals, the best adaptations and innovations will be pretty good'.[62] Its popularity lies in its being a 'cheap and simple' solution.[63] Dale Jamieson says:

> Technological approaches are popular both with politicians and with the public because they promise solutions to environmental problems without forcing us to change our values, ways of life, or economic systems . . . the image of the scientist as

[59] See S. Pacala and R. Socolow, 'Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies', *Science* 305 (2044): 968—72.

[60] See R. Stuart Haszeldine, 'Carbon Capture and Storage: How Green Can Black Be?' *Science* 325 (2009): 1647—52.

[61] See John Fogarty and Michael McCally, 'Health and Safety Risks of Carbon Capture and Storage', *Journal of the American Medical Association* 303 (2010): 67—68.

[62] Kahn, *Climatopolis*, 243.

[63] Levitt and Dubner, *Superfreakonomics*, 177. See Lomborg, *Cool It*, 116—23.

the "can-do" guy who can solve any problem remains quite potent.[64]

Cheap solutions that will leave our daily lives largely unchanged are an attractive option.[65]

The problem is that too often technological advances producing energy savings have been counterproductive.[66] For example, it is argued:

> More power-efficient washing machines or better insulated houses will help the environment; but they also cut our bills, and that immediately means we lose some of the environmental gain by spending the saved money on something else. As cars have become more fuel-efficient we have chosen to drive further. As houses have become better insulated we have raised standards of heating, and as we put in energy-saving light bulbs the chances are that we start to think it doesn't matter so much leaving them on.[67]

Energy efficiencies have not led to the carbon emission reductions they promised. If adaptation were to be a primary aim of climate change policy, then we require higher confidence that technological advances would lead to greater reductions rather than result in counterproductive behaviour.

---

[64] Dale Jamieson, *Ethics and the Environment: An Introduction* (Cambridge: Cambridge University Press, 2008): 13.

[65] Adaptation measures assume we will have sufficient resources to enable us to adapt to future climate changes. Suppose this were true. Such an approach may be an available option, but prove irrational because long-term costs of adaptation may be much higher than conservation.

[66] See Paul Wapner and John Willoughby, 'The Irony of Environmentalism: The Ecological Futility but Political Necessity of Lifestyle Change', *Ethics and International Affairs* 19 (2005): 77-89.

[67] Richard Wilkinson and Kate Pickett, *The Spirit Level: Why Equality is Better for Everyone, revised edition* (London: Penguin, 2010): 223.

This brings us to the understanding of relevant risks. Adaptation proponents are less risk averse than conservationists. If no measures whether adaptive or conservationist are taken, then there is a genuine risk of our reaching dangerous tipping points and environmental catastrophe. Not only do adaptation proponents believe it possible to satisfactorily adapt, but they also have greater scepticism about the likely danger of reaching tipping points in the foreseeable future.

This is perhaps more than an interpretive debate over the role of the precautionary principle because of the size of the relevant risks.[68] Adaptation may succeed for the present, but be reckless as a long-term policy. Furthermore, the adaptation approach has a more casual concern about the moral permissibility of exposing the environment to greater risk than conservation. All living things require resources and impact the environment. The question is whether it is morally permissible to expose higher than necessary risks where it might be avoided. Adaptation proponents must argue more persuasively for why these risks are morally permissible and not merely more cost effective.[69]

Adaptation is an important aspect of any climate change policy. The climate is already changing and we must change with it. The problem is whether this policy should primarily focus on adaptation instead of conservation. There are many reasons to doubt that any such policy can proceed or would be wise. There is too much faith on untested and unknown

[68] See Stephen F. Haller, *Apocalypse Soon? Wagering on Warnings of Global Catastrophe* (Montreal: McGill-Queens, 2002) and Cass R. Sunstein, *Laws of Fear: Beyond the Precautionary Principle* (Cambridge: Cambridge University Press, 2005).

[69] A possible reply is that adaptation does not expose others to risk, but rather helps create new conditions which foreclose risks from arising. We do not then harm others through exposure to risk first and then remove risk later, but remove this risk altogether. This reply rests on high confidence that such risks may be identified early and removed before they become threatening. We need further evidence to justify such confidence in speculative measures. For example, see Thom Brooks, 'Climate Change and Negative Duties', *Politics* 32 (2012): 1—9. Note that the point here is not that unnecessary risks always wrong others, but that it can do so and thus it is important to consider the possible relation between them.

technologies that may have counterproductive outcomes in an uncertain future. The need for adaptative technologies is compelling as part of a broader strategy, but it cannot serve as the primary focus.

Adaptation is an unsatisfactory solution to how we might best address the associated dangers of climate change.

V. Climate Change and Catastrophe

Our challenge is not to determine whether there is climate change or its associated dangers, but rather how best to respond to it. This challenge does not admit of ready answers as the issue is complex and difficult. Much of my discussion above has focused on where different approaches have proven unsatisfactory. While most commentators endorse some combination of conservationist and adaptation measures, their proposals usually emphasize either conservationism or adaptation. I have argued that neither conservationist proposals such as the ecological footprint or the polluter pays principle nor adaptation strategies are convincing individual solutions to the problem of climate change.[70]

These strategies share in a common mistake concerning the nature of the central problem. Both conservation and adaptation proponents claim their approach provides a *solution* to the problems associated with climate change.[71] Conservationists argue that adopting a policy based around ecological footprints or a polluter pays principle will lead to a sustainable future. Adaptation proponents claim we should focus our efforts on adapting to

[70] See Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press, 2011): 7: 'existing theories are extremely underdeveloped in many of the relevant areas, including intergenerational ethics, international justice, scientific uncertainty, and the human relationship to animals and the rest of nature'.

[71] See Thom Brooks, 'The Real Challenge of Climate Change', *PS: Political Science and Politics* 46 (2013): 34—36.

future climate change along with modest reductions in carbon emissions to ensure a sustainable future and even 'a happy ending'[72]. Both approaches aim to offer what we might call *an end-state solution* to the problem of climate change: 'The world now has the technologies and financial resources to stabilize climate'.[73] The possibility of permanently ending climate change is conceived as an achievable end-state—if only governments followed the correct approach, then the problems arising from climate change could be solved permanently.[74]

This orthodox view is a mistake because there is likely no happy ever after. It is false to believe that only human activity influences climatic change, but it is also incorrect to claim that human activity might end it. The problem is that we cannot stop the climate from changing any more than we can the world from turning. Our climate will change regardless of our efforts and it has changed many times before human beings first evolved. So the problem is not that the climate is changing, but rather that it is changing so quickly making its management especially difficult and complex. End-state solutions to the problem of climate change may be doomed to fail from the start. Environmental catastrophe is not something to

[72] Kahn, *Climatopolis*, 12.

[73] Lester R. Brown, *World on the Edge: How to Prevent Environmental and Economic Collapse* (New York: W. W. Norton, 2011): 198.

[74] One possible objection is that my characterisation is inaccurate. Conservationists and adaptation proponents do not always expressly indicate that if we endorse a favoured policy then climate change can be managed successfully without additional policies needed. I do not deny the fact most commentators taking either approach might accept additional politics may be required beyond what they recommend. It remains the case that several expressly claim to 'solve' the problem of climate change if we adopt a favoured proposal and I have highlighted several examples in this article. My critique refers to the general character of most work falling under either conservationist or adaptation approaches: if something more beyond adoption of an ecological footprint or polluter pays principle is required, then this is too often unacknowledged. This is not a question of making clearer the combination of conservationist and adaptation approaches within a coherent policy aimed at better managing climate change, but instead the failure of most commentators to acknowledge the limits of favoured policies as an end-state view that might do no better than temporarily manage the climate change we experience. For one exception, see Jamieson, *Reason in a Dark Time*. I am

be avoided, but rather an event at best postponed. So the issue is that not only might conservationist and adaptation proposals not yield the solutions they promise to the problem they address, but that they are also mistaken about the problem itself.

Does this ultimately hand victory to the strategy of adaptation or skeptics? No, it does not. The fact that our climate will change is not a compelling reason to exacerbate the arrival of unknown future conditions with potentially catastrophic consequences and our doing nothing will only make the situation much worse. Nor might the fact that a future ice age or other environmental catastrophe is unavoidable support our ending measures to reduce current and future environmental damage alongside improving our adaptability to changing conditions.[75]

Instead, we might approach climate change from a new perspective. Our focus should not only be on how we might reduce our environmental impact, but we should extend our focus to another question: what are the normative implications of a future environmental catastrophe both foreseeable and perhaps inevitable? This different focus reinterprets climate change as a problem of management where we approach these questions in a new way. Our proposals should reconsider sustainability for a tragic world—*our* tragic world—where the choices we have are less clear cut and more sobering than the overly, and unrealistically, optimistic solutions already offered.

The fact of a foreseeable, and perhaps inevitable, climatic catastrophe expands our

---

grateful to a referee for pressing this issue.

[75] While there have been longstanding concerns about the possible inevitability of a future ice age, the planet's slow cooling is being trumped by warming caused by the increased greenhouse effect. While an ice age might now be much less likely than previously thought, now the concern has shifted to whether short-term catastrophe due to global warming is inevitable. So while the nature of the form any future catastrophe might take has shifted, there is no less a concern about the likelihood of an environmental catastrophe because of climate change and its possible effects. I am grateful to a referee for highlighting the importance of this point.

normative horizons. Suppose an environmental catastrophe is avoidable if all persons adopted a particular policy, such as living within an ecological footprint. The motivation for supporting this policy is its guarantee of avoiding catastrophe and its devastating consequences. We can assess the relative costs and benefits of adopting or rejecting this proposal against others in light of this guarantee. Our debates may centre on the certainty of this guarantee and its general advantages relating to alternative policies, such as pursuing an approach emphasizing adaptability.

Now suppose an environmental catastrophe is not avoidable irrespective of whichever policy is adopted. The motivation for supporting a particular approach cannot be its guarantee of avoiding catastrophe. Determining the relative costs and benefits of our possible actions becomes more complex because our timescale is longer: it is not a matter of now and the permanently sustainable point in future, but a future of changing conditions.

This analysis rests on the view that radical climate change leading to catastrophe is inevitable. It might be objected that the climate might have fluctuated in the past, but it is not obvious that it must continue to do in future. And even if it were to do so we might think it possible that human beings could obtain the ability to control it.

This challenge is unsuccessful because there is much less evidence to support the view no future environmental catastrophe is likely or within our likely future abilities to avoid. It is more science fiction than fact that we will be able to control the global environment with any confidence in the foreseeable future. Scientists may not be divided about whether the climate is changing, but there are serious divisions about its scale and even its nature.[76] For example, there is widespread debate about the most promising model for

[76] See Richard A. Posner, *Catastrophe: Risk and Response* (Oxford: Oxford University Press, 2004): 43—58.

capturing climate change.[77] Climate scientists accept cyclical climatic changes, but there is no clearly dominant view about their causes.[78] As one scientist puts it, 'many aspects of ice-age dynamics remain a mystery'.[79] In summary, we might know more about how to destroy our planet—through triggering environmental catastrophes or nuclear warfare—than how it might be preserved, or save it from ourselves. If so, it should be more compelling to consider any proposal concerning climate change in light of our relatively limited knowledge about how climatic cycles work beyond that they exist and likely to evade our efforts to control them.

A second potential criticism is that even if the climate does change radically, it need not entail catastrophe. This is because human beings might become able to adapt—or at least more capable of adapting—in future whether through technological advances or perhaps escaping the planet altogether.

This criticism stems from the adaptation approach which argues it can and should be possible to adapt to future climate change. I criticized earlier the view that we might adapt to future climate change because it claims we can avoid catastrophe through scientific advances that have not been made. Instead, it is a kind of faith in unknown future technology to solve a known future problem. However unlikely, it is at least theoretically possible that sufficient scientific advances might render radical climate change less dangerous for human beings long-term. It might even be urgent that we invest much more in adaptation technologies to

[77] See Pascale Braconnot, Sandy P. Harrison, Masa Kageyama, Patrick J. Bartlein, Valerie Masson-Delmotte, Ayako Abe-Ouchi, Bette Otto-Bliesner and Yan, Zhao, 'Evaluation of Climate Models using Palaeoclimatic Data', *Nature—Climate Change* 2 (2012): 417—24.

[78] For example, see on glacial cycles Ayako Abe-Ouchi, Fuyuki Saito, Kenki Mawamura, Maureen E. Raymo, Jun'ichi Okuno, Kunio and Takashi and Heinz Blatter, 'Insolation-driven 100,000-year Glacial Cycles and Hysteresis of Ice-sheet Volume', *Nature* 500 (2013): 190—93.

[79] Shawn J. Marshall, 'Climate Science: Solution Proposed for Ice-Age Mystery',

better manage short-term likely consequences of climate change. But even if so, then our viewing adaptability in light of changing future climatic conditions is different from the position held today by adaptation proponents where the future is more constant and manageable.

A final possible criticism concerns practical implications. So if I am correct and a future environmental catastrophe is foreseeable and likely unavoidable, then what should we do now that we are not doing already? One answer is reducing environmental impact through measures such as conservation may be insufficient. Some investment in adaptation is not only rendered necessary because of the climate change already underway, but because it is inevitable given the likelihood of future climate change even if humans left no ecological footprint. Reducing our impact through conservation may be one important, if not the most important, means to delay a future environmental catastrophe for as long as possible. However, conservation is not and cannot be sufficient on its own. We require some degree of adaptation, too.

The conservation and adaptation measures we should consider may be larger than thought. This is because our option is not what we can do to permanently avoid a future environmental catastrophe, but how we might best endure it. One part of the answer might be to promote conservation as a means to delaying any such future event and so providing more time for achieving satisfactory scientific advances. But the difference is that while most political philosophers have conceived this as a problem that can be solved and so avoided, they have failed to see that even the major changes required to substantially reduce human environmental impact globally is not the full picture of what may be required to endure radical climatic change. There is no short-term fix or single solution to this problem that is

---

Nature 500 (2013): 159—60.

perhaps more permanent and more pressing than understood previously. Following Jamieson, we should heed his warning: 'do not let the perfect be the enemy of the good'.[80] The importance of conservationist and adaptation strategies does not disappear because they might only manage and not solve the problem of avoiding environmental catastrophe through climate change. Their disappearance might only make a bad situation worse.[81] My point is that these approaches should be considered in a new light.

VI. Conclusion

Climate change is an issue of great importance. Philosophers have developed contributions that aim to address climate change, but they run into two serious concerns. The first is that their proposals might not lead to the conclusions they claim. Most of this article focuses on this concern. A second, related problem is that many philosophers are mistaken about the problem they aim to address. They believe a sustainable future is an end-state and our primary focus for discussions about climate change. I have argued this view is mistaken. Both proponents of conservation and adaptation defend proposals built around climate change as a problem that can be solved. I have argued this and this raises new questions about how it is understood. This is not where our discussion ends, but instead only where it should begin. If the climate may continually change, then we must change with it and in light of the real future possibility of environmental catastrophe no matter our efforts to avoid it. This is the daunting challenge we face.

[80] Jamieson, *Reason in a Dark Time*, 9.
[81] See Jamieson, *Reason in a Dark Time*, 228.